BREEDING SYSTEMS IN THE WESTERN AUSTRALIAN FLORA. II. POLLINATION OF *DIPLOLAENA* AND *CHORILAENA* (RUTACEAE)

By G. J. KEIGHERY, Kings Park & Botanic Garden, West Perth

ABSTRACT

Pollination vectors for four of the seven species of the genera *Chorilaena* and *Diplolaena* have been studied. In all cases these were shown to be honeyeaters (Meliphagidae).

All members of the genera *Diplolaena* (the Native Rose) and *Chorilaena* are endemic to South-Western Australia. They both possess a unique inflorescence morphology for the Rutaceae (Hutchison, 1969), and are considered ancient genera of uncertain affinity both within the Rutaceae and to each other (Smith-White, 1954).

This paper forms the first in a series on the pollination biology of the endemic genera of the Rutaceae, none of which have been studied previously. I will attempt to place these findings into the general scheme proposed by Keighery (1977).

OBSERVATIONS

Diplolaena

The flower head consists of a drooping cluster of flowers (Fig. 1, I) surrounded by bracts. The stamens and floral parts are generally orange-red with pale green bracts (see Gardner, 1959: 81). During flowering the inflorescences are visually striking, and the plants tend to occur in clumps massing the blooms. Flowering commences in August continuing till mid November. In cultivation the inflorescence remains open for 7-10 days and capable of pollination. All species appear self fertile.

Diplolaena dampieri was studied for vectors at Point Peron, Rockingham and Garden Island. Insect visitors to the flowers included small beetles, ants, cockroaches and honey bees. It is possible that the honey bee causes pollination, but it cannot be classified as a natural vector.

The major vectors were the Little Wattle-bird *(Anthochaera chrysoptera),* the Brown Honeyeater *(Lichmera indistincta),* occasionally Silvereyes *(Zosterops gouldi)* and the Singing Honeyeater *(Meliphaga virescens).*

Sightings of Brown Honeyeaters visiting *D. angustifolia* in Yanchep National Park were made in October 1972. Unidentified honeyeaters were seen visiting a large population of *D. microcephala* at the base of a large granite rock east of Yoting in August 1974.

Plantings of *D. angustifolia, D. drummondii, D. grandiflora* and *D. microcephala* in Kings Park and Botanic Garden are sporadically visited by the many types of resident honeyeaters.

Chorilaena

Again the inflorescence is organised into a drooping head, although much more loosely than that of *Diplolaena* (Figs. 1, 2 and 3). The flowers are white-pale green with light green bracts (see Erickson *et al.,* 1974: 59) and stand out in the gloomy Karri understorey. The plants are gregarious and flower profusely between August and January. In cultivation the flowers remain open for 5-9 days, and the plants do not appear to be self fertile.

Observations on the only species, *C. quercifolia* were made on a dense post fire thicket at the base of Mt. Chudalup, approximately 10 km south of Northcliffe, in October 1974. The bushes were flowering profusely and were being actively probed for nectar by White-cheeked honeyeaters *(Phylidonyris niger).* No other possible vectors visited the flowers during the periods of observation.

SUMMARY

Both genera are bird pollinated, and possess flower heads that are adapted to this mode of pollination. They are large, conspicuous, held in a pendant position near the alighting positions, have a good supply of

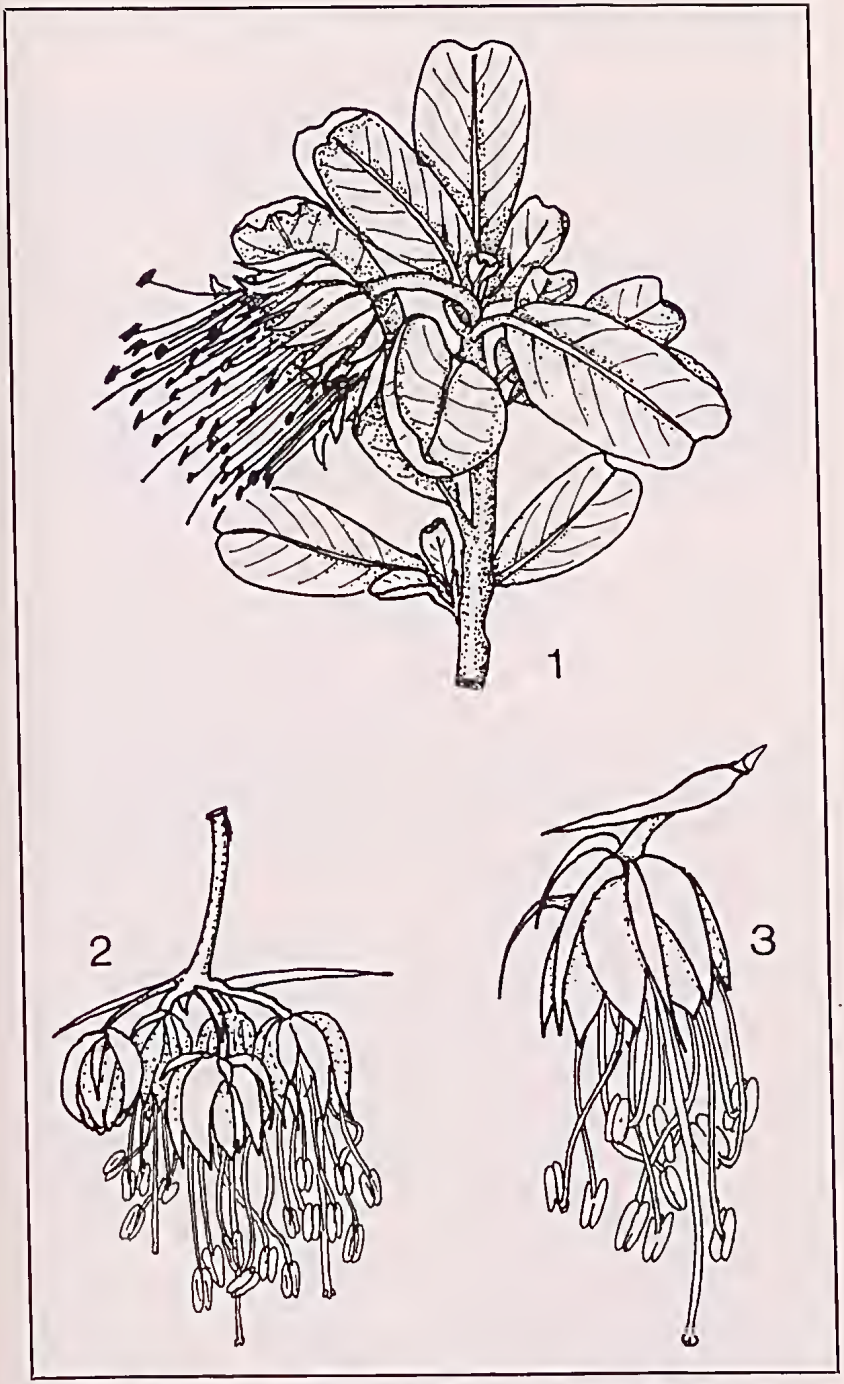

Fig. 1.—1. *Diplolaena grandiflora:* inflorescence x 1; 2. *Chorilaena quercifolia:* inflorescence x 2; 3. *C. quercifolia:* single flower x 4.

nectar which is difficult for smaller insects to obtain and have little smell as birds zero in by sight not scent.

ACKNOWLEDGEMENTS

The author gratefully aeknowledges the help of Mr. Allan Burbidge at Mt. Chudalup and the assistanec of funds from the Australian Biological Resources Council whieh made a visit to this area possible.

REFERENCES

ERICKSON, R., A. S. GEORGE, N. G. MARCHANT and M. K. MORCOMBE. 1973. *Flowers and Plants of Western Australia.* A. H. and A. W. Reed: Sydney.

GARDNER, C. A. 1959. *Wildflowers of Western Australia,* West. Aust. Newspapers Press: Perth.

HUTCHISON, J. 1969. *Evolution and Phylogeny of Flowering Plants.* Academic Press: London.

KEIGHERY, G. J. 1977. Breeding Systems of the Western Australian Flora III Basic data on the Rutaeeae. *W. Aust. Nat.* (in press).

SMITH-WHITE, S. 1954. Chromosome Numbers in the Boronieae (Rutaeeae) and their bearing on the evolutionary development of the Tribe in the Australian Flora. *Aust. J. Bot.,* 2: 287-303.

AVIFAUNA OF BLACK POINT—CAPE BEAUFORT AREA, S.W. AUSTRALIA

By IAN ABBOTT, Zoology Department, University of Western Australia, Nedlands.

I spent 22 and 23 April, 1976 investigating the avifauna of the Blaek Point-Cape Beaufort area. The Point and Capc are the S. and N. sides of a low (43 m) but conspieuous tesselatcd basalt tongue of land projecting from thc coast, about 40 km S of Nannup, between Cape Leeuwin and Point d'Entrecasteaux. Nothing of the birds of this area appears to have been publishcd before. Access to the Point is by four-wheel drive track, whieh is passable only between January and May. The area covered in this report is within a radius of 3 km of Black Point. During my visit the weather was finc and sunny.

The habitats available for birds are as follows.

1. Rocky seashore and sandy beaches on either side of thc Point and Cape. Four plant species occur on thc beachcs: *Ammophila arenaria, Spinifex hirsutus, Arctotheca populifolia,* and *Cakile maritima.*

2. Zone of salt tolerant plant species. Main speeies are *Salicornia quinqueflora, Samolus repens, Apium prostratum, Carpobrotus rossii, Calocephalus brownii, Cotula* sp., *Lobelia alata, Poa australis, Threlkeldia diffusa, Scirpus nodosus, Sonchus oleraceus* and *Anagallis arvensis.*

3. Low heath on sand dunes, made up of thickets 1-2 m high. Main plant species are *Jacksonia horrida* (dominant), *Scirpus nodosus, Lepidosperma gladiatum, Olearia axillaris, Acacia decipiens, Boronia alata.* Further from thc coast other spccies come in, the chief ones being *Agonis flexuosa, Cassytha* sp., *Casuarina* sp., *Hibbertia cuneiformis, Sollya heterophylla, Lepidosperma angustatum, Spyridium globulosom, Leucopogon parviflorus, Xanthorrhoea preissii, Loxocarya flexuosa, Scaevola nitida, Muehlenbeckia adpressa, Acacia heteroclita, Dryandra cuneata,* and *Hibbertia* sp.

4. Swales near thc coast contain *Juncus* swamp with odd clumps of a white-barked *Melaleuca.* Further inland thickets of *Oxylobium* sp., *Banksia littoralis* (flowering), to 5 m, and odd clumps of stunted Jarrah occur.

Further inland still swales contain *Agonis flexuosa* woodlands (trees